Monitoring and Mitigation Plan for Mining Under the East Fork of Box Canyon

Implementation of the following mitigation plan should quickly identify surface disturbance or impacts from subsidence fractures intercepting spring and stream flows. Frequent monitoring will establish the degree of impacts to water resources, vegetation, wildlife and other uses.

The monitoring and mitigation plan adopted by the permittee should provide sufficient data for all stakeholders associated with these resources and lands to make a determination of the degree of impacts. Information and data collection will be continuous before the area is mined, throughout the mining period, and after mining is past, until impacts are not detectable.

Hydrological and Subsidence Mitigation Plan for Mining Under Panels 3LPE and 4LPE in the East Fork of Box Canyon

Subsidence R645-301-525.454

- Conduct pre- and post-mining video surveys of the East Fork of Box Canyon stream channel over panels 3LPE and 4LPE. The Permittee must conduct a post-mining survey during September of 2006. This post-mining video survey must apply the same procedures as the video survey conducted September 2003.
    - Videotape the stream channel from Joe's Mill Ponds to the west gate road of the 3LPE panel.
    - Establish at least 10 stations to portray stream flow, vegetation, soils, etc. GPS coordinates shall be obtained for each site. Each site must be documented with fixed photo points that can be reproduced during subsequent monitoring intervals (see #4 below). Identify and survey in the Thalweg. Monitor at least two pools and associated falls in the perennial section of the channel. Two sites must include EFB9 and EFB11. Monitoring criteria must include width and depth of the pools, and height of fall structures.
    - Establish location of perennial flow, gaining/losing reaches of the stream channel.
    - Qualified botanist must participate in the taping of the channel video.
        - Identify major representative plant species along the stream channel and riparian and spring areas (5 springs: 2 have two separate discharge sites that merge into a single channel leading towards the stream).
        - Identify hanging gardens.
    - Video tape and mention all animal species present:
        - Macroinvertibrate presence at water monitoring stations along the stream channel and riparian and spring areas.
        - All other animal species along the stream channel and riparian and spring areas.

- Fourth quarter water monitoring shall be conducted prior to mining under the stream channel.
- While mining under the channel, promptly identify subsidence-induced fractures, dewatering, diminution of water quality, and movement of the stream channel.
- Monitor sites for fractures two times per week while mining within the angle-of-draw of the stream channel. Continue weekly for a period of 8 weeks after the shears have passed the 15-degree angle-of-draw opposite the stream channel. Monitor flow and channel convergence weekly while in the angle of draw. Then monitor both fractures, flow and convergence every two weeks for the next 8 weeks. Continue monitoring quarterly for 2-year period after no subsidence, interception, diminution or diversions are identified.
- Immediately seal subsidence cracks and fractures identified within the stream channel wet bank with bentonite or bentonite grout. Access must be limited to methods that would not cause additional effects to the aquatic ecosystem.
- Conduct uninterrupted longwall mining progression, except for normally scheduled maintenance, while under the 15-degree angle-of-draw of the stream channel.
- Provide a weekly report to DOGM via e-mail. Identify any changes in surface expression, dates, any fracturing of surface (location, width, spacing, etc.), any repairs, location of longwall. The Division will provide a copy of the report to the Manti-La Sal National Forest.
- If the applicant cannot gain access to the site, attempts must be documented.
- The applicant will be required to abide by the mitigation outlined in the approved MRP.
- Comply with federal and State rules and regulations.
    - Refer to Conditions of Approval of the Resource Recovery and Protection Plan (R2P2), July 31, 2003.
    - The permittee shall obtain a stream alteration permit, required by Utah Division of Water Rights, prior to conducting construction activities in the stream channel for mitigation.
    -

Water Rights Replacement of State Appropriated Water Supplies (R645-301-731.530)

- Establish a rain and temperature monitoring station.
- Promptly replace or compensate any State appropriated water supply that is contaminated, diminished or interrupted by mining operations for:
    - Cattle
    - Drinking water
- Calculate the amount of diminished flows from monitoring data.

Hydrologic and Subsidence Summary Report

- Submit a summary report to the Division documenting the pre- and post-mining conditions of springs and stream channel. Describe all activities and work conducted by the applicant for site evaluation and mitigation. Identify if impacts have occurred, and if mitigation activities have prevented material damage to resources. The report will be due 90 days after subsidence monitoring is complete for each panel section. The Division will provide a copy of the report to the Manti-La Sal National Forest.

Biology Monitoring Plan for Mining Under Panels 3Left, 4Left in the East Fork of Box Canyon (September 29, 2003)

The Permittee must follow basics of the Division's Guidelines. A qualified botanist must survey the stream channel and associated spring areas starting from Joe's Mill Pond to 3LPE. A qualified biologist must survey the baseline for macroinvertibrate along the stream channel.

Stream channel and spring geomorphology and vegetation:

- Stream channel geomorphology – at a minimum define:
  - Geologic/surface substrate of stream bottom.
  - Width of stream channel at water-monitoring locations.
- Spring and surrounding area geomorphology – at a minimum define:
  - Geologic/surface substrate of spring area where the water discharges.
  - Geologic/surface substrate of the spring *tributary* where water converges from the discharge site(s) and forms a *tributary* of the East Fork stream.
  - Width of the spring *tributary* at the location where the consultant surveys vegetation.
- Stream channel and spring vegetation communities – at a minimum:
  - Survey all stream and spring monitoring locations.
  - Define vegetation communities at all monitoring locations.
  - Inventory map of vegetation communities at all monitoring locations.
- Stream channel and spring area threatened, endangered, candidate, and sensitive species. Survey all TEC and Sensitive species including the Link Canyon Columbine. Provide population location and individual numbers for each population.
- Stream channel and spring area vegetation community condition – at a minimum:
  - Describe condition at the meadow near Joe's Mill Pond.
  - Describe condition along steam bank. Concentrate observations at all monitoring locations.
  - Describe condition at all spring locations. Concentrate observations at all monitoring locations as well as discharge sites if different from monitoring locations.
  - Provide photographs of communities along stream channel, on hillsides flanking the steam channel, and at spring locations. Take photographs at established photo points.

    - Describe effects of erosion along stream channel, on hillsides flanking the steam channel, and at spring locations. Numerically rate erosion effects. For example, 1=extreme erosion, 2=high erosion, 3=moderate erosion, 4=slight erosion, 5=no erosion.
    - Repeat vegetation community condition observations two times a year (beginning and end of growing seasons) for the first three years and the fifth year following undermining. Refer to schedule below.
- Provide two copies of the survey reports to DOGM. Include one copy in DOGM Annual Reports. The Division will provide the second copies to the Manti-La Sal National Forest.
    - Baseline data prior to undermining: 2003 report in the 2004 Annual Report.
    - 1st year data following undermining: 2004 report in the 2005 Annual Report.
    - 2nd year data following undermining: 2005 report in the 2006 Annual Report. Conduct survey and submit report adhering to the *stream channel and spring area vegetation community condition* requirements, **only**.
    - 3rd year data following undermining: 2006 report in the 2007 Annual Report.
    - 5th year data following undermining: 2008 report in the 2009 Annual Report.

Stream channel and spring infrared vegetation maps:

- Stream channel and spring area low level, colored infrared maps for the baseline year (2003) and fifth year (2008) following undermining.
- Provide two copies of the survey reports and maps to DOGM. Include one copy in the 2004 and 2009 DOGM Annual Reports. The Division will provide the second copies to the Manti-La Sal National Forest.

Stream channel macroinvertibrate:

- Stream channel macroinvertibrate. The survey must include – at a minimum:
    - EFB4 and EFB11 monitoring sites.
    - Organism species and number (#/m^2).
    - Contractor must consult with DOGM for approved survey protocol.
- Provide two copies of the survey reports and maps to DOGM. Include one copy in the DOGM Annual Reports. The Division will provide the second copies to the Manti-La Sal National Forest.
    - Baseline data prior to undermining: 2003 report in the 2004 Annual Report.
    - 1st year data following undermining: 2004 report in the 2005 Annual Report.
    - 2nd year data following undermining: 2005 report in the 2006 Annual Report.

The mine operator will implement, if necessary, a revegetation/mitigation plan as determined by DOGM in consultation with the USFS.

Cultural Resource Monitoring Plan for Mining Under Panels 3Left, 4Left in the East Fork of Box Canyon (September 8, 2003)

Monitoring Plan: (MOA 00-MU-11041000-017; MRP pgs 4-9 to 4-10)

Amend MRP to reflect the implementation of Monitoring Plan in respect to the NRHP eligible -Elusive Peacock. Provide two copies of an Executive Summary of monitoring results. Include one copy in DOGM Annual Reports (2003, 2004, 2005, 2006, and indefinitely until movement ceases). The Division will provide the second copy to the Manti-La Sal National Forest.

Monitoring Plan: (paraphrased from MOA 00-MU-11041000-017 pg 12; refer to MOA for the explicit schedule)

- One time event: The Permittee will provide baseline conditions six months prior to the period of mining.
- One time per month: The Permittee will monitor one time per month within six months following the onset of active subsidence. (1-6 mos)
- Quarterly: The Permittee will monitor one time every three months for six months following the completion of the one time per month schedule. (6-12 mos)
- Yearly1: The Permittee will monitor yearly for two years following the completion of the quarterly schedule. (12 - 36 mos)
- Yearly2: The Permittee will monitor yearly for additional years following the completion of the yearly1 schedule if monitoring indicates further movement of the ground surface. (36 mos – indefinite amount of time)

Note, sites listed under the Monitoring Schedule B are the following:

42SV2492/ML-3582	No name	Prehistoric Rockshelter
42SV2433/ML-3449	Big Mac	Prehistoric Rockshelter
42SV2434/ML-3450	Little Mac	Prehistoric Rockshelter
42SV2341/ML-3335	No name	Prehistoric Rockshelter.

Errata
October 1, 2003

Monitoring and Mitigation Plan for Mining Under the East Fork of Box Canyon

First Paragraph
Delete “to monitoring” from sentence.

Sentence should read,
Frequent monitoring will establish the degree of impacts to water resources, vegetation, wildlife and other uses.

Second Paragraph
Change stockholders to stakeholders.

Sentence should read,
The monitoring and mitigation plan adopted by the permittee should provide sufficient data for all **stakeholders** associated with these resources and lands to make a determination of the degree of impacts.

Last bullet under Subsidence
Reword sentence,
A stream alteration permit is required by Utah Division of Water Rights for any stream channel construction activities. The applicant must obtain the permit prior to mining within the angle-of-draw of 15 degrees of the stream channel.

Sentence should read,
The permittee shall obtain a stream alteration permit, required by theUtah Division of Water Rights, prior to conducting construction activities in the stream channel for mitigation.